

What is claimed is:

1. An antenna duplexer comprising:

- i) a transmitter surface acoustic wave (SAW) filter;
- ii) a phase shift circuit whose one port is electrically connected with  
5 an output port of the transmitter SAW filter; and
- iii) a receiver SAW filter whose input port is electrically connected  
with remaining one port of the phase shift circuit,

wherein the transmitter and receiver SAW filters have different  
frequency bands, providing attenuation with each other,

- 10 the phase shift circuit i) shifts a phase of the receiver SAW filter in its  
transmitter-band; and ii) has a phase angle and a characteristic impedance with  
which a magnitude of a reflection coefficient at a center frequency in the  
transmitter-band of receiver SAW filter is to be not less than 0.8 and the phase  
angle of reflection coefficient at a center frequency in the transmitter-band of  
15 receiver SAW filter is to be from  $0^\circ$  to  $45^\circ$ .

2. The antenna duplexer of claim 1, wherein the phase shift circuit has a  
less-than-50 ohm characteristic impedance.

- 20 3. The antenna duplexer of claim 2, wherein the characteristic impedance  
of the phase shift circuit takes  $42 \pm 8$  ohms excluding 50 ohms.

4. The antenna duplexer of claim 1, wherein the transmitter SAW filter is  
a ladder-type filter, in which a resonance frequency of a serial-branch SAW  
25 resonator is higher than an anti-resonance frequency of a parallel-branch SAW  
resonator.

5. The antenna duplexer of claim 1, wherein the phase angle of the phase shift circuit takes  $90 \pm 10^\circ$ .

6. The antenna duplexer of claim 1, wherein the characteristic impedance  
5 of the phase shift circuit takes  $42 \pm 8$  ohms excluding 50 ohms, and the phase angle of the phase shift circuit takes  $90 \pm 10^\circ$ .

7. An antenna duplexer comprising:

a transmitter surface acoustic wave (SAW) filter;

10 a phase shift circuit whose one port is electrically connected with an output port of the transmitter SAW filter; and

a receiver SAW filter whose input port is electrically connected with remaining one port of the phase shift circuit,

wherein the transmitter and receiver SAW filters have different pass  
15 bands and attenuate the other pass band with each other.,

the phase shift circuit i) shifts a phase of the receiver SAW filter in its transmitter-band; and ii) has a less-than-50 ohm characteristic impedance.

8. The antenna duplexer of claim 7, wherein the characteristic impedance  
20 of the phase shift circuit takes  $42 \pm 8$  ohms excluding 50 ohms.